

REMARKS

Applicants appreciate the thorough examination of the application that is reflected in the Final Office Action dated August 3, 2006. To expedite the prosecution of this application, this Response amends independent claims 1, 11, 19, 24, 25, 31, and dependent claims 35 and 36.

After entry of the foregoing amendments, claims 1-37 (37 total claims; 6 independent claims) remain pending in the application. Reconsideration of the application is respectfully requested in view of the above amendments and the following remarks.

**Interview Summary**

Applicants also thank the Examiner for his time during the telephone interview of September 27, 2006. As discussed during the telephone interview, Applicants amend claims 1, 11, 19, 24, 25, 31, and submit that those claims distinguish over the cited references. Applicants summarize some of the points made during that telephone interview below.

**Claim Rejections Under 35 U.S.C. 112, 1st Paragraph**

The Office Action rejects claims 1-37 under 35 U.S.C. 112, first paragraph since those claims allegedly fail to comply with the written description requirement.

To expedite prosecution of this application, Applicants amend each of the independent claims to remove some of the limitations added in the previous response. For example, the recitation “at a utilization factor so that said device operates at a machine utilization factor that increases a rate of delivery of composite material disproportionately beyond the increase of the number of material delivery heads of said plurality of material delivery heads over a single material delivery head,” in claim 31 has been deleted. Similar amendments are made to each of the other independent claims.

Applicants submit that the rejection of claims 1-37 under 35 U.S.C. 112, first paragraph is moot in view of the amendments described above.

Accordingly, Applicant respectfully requests that the rejections of claims 1-37 under 35 U.S.C. 112, 1st paragraph be withdrawn.

**Claim Rejections Under 35 U.S.C. 112, 2nd paragraph**

The Office Action also rejects claims 1-37 under 35 U.S.C. 112, 2<sup>nd</sup> paragraph as allegedly being indefinite.

Applicants submit that the rejection of claims 1-37 under 35 U.S.C. 112, second paragraph is moot in light of the amendments to the claims outlined above.

Accordingly, for at least this reason, Applicant(s) submit that the rejection of those claims under 35 U.S.C. 112, 2nd paragraph should be withdrawn.

### **Art-based Rejections**

#### **Claims 1-37**

The Office Action rejects claims 1-37 under 35 U.S.C. 103(a) as being unpatentable over PCT WO 03/035380 in view of Koury and either one of Bendarzewski et al. or Zsolnay et al. further taken with the admitted prior art and E.P. 198,744 optionally further taken with Ermert.

Applicants respectfully traverse these rejections for at least the following reasons.

#### **Independent Claim 31**

Independent claim 31 relates to a method for automated composite lamination on a mandrel surface of a tool having an axis:

supporting a plurality of material delivery heads wherein the tool is moveable relative to said plurality of material delivery heads, wherein each of the material delivery heads are configured to provide a composite material having a width of at least 12 inches;

providing for movement of said plurality of material delivery heads relative to the mandrel surface;

providing for each of said plurality of material delivery heads an individual position adjustment relative to the other ones of said plurality of material delivery heads and independently relative to the mandrel surface; and

operating each material delivery head so that a mandrel having a diameter of at least 14 feet is covered with said composite material at a peak rate of at least 700 pounds per hour (lbs/hr). (Emphasis added.)

PCT WO 03/035380 relates to a method for making aerodynamic structures using an assembly of mandrels and consisting in: a) a first deposition of fibers on each mandrel to coat each mandrel; b) vacuum compaction of said fiber deposition and/or infusion of said deposition with a polymerizable resin; c) polymerizing the first deposition; d) setting and locking the mandrels in a hollow mould so as to defined free spaces in the mould; e) injecting resin in the mould so as to fill at least partly the free spaces, to produce reinforcements in an envelope of the structure or in internal partitions of said structure; f) polymerizing the resin and the assembly formed, and stripping said assembly; g) carrying out a second fiber deposition; h)

setting the assembly in a hollow mould and performing step b); i) polymerizing the assembly and stripping the resulting final structure; j) carrying out a finishing treatment of the structure obtained at step i). PCT WO 03/035380 does not disclose supporting a plurality of material delivery heads wherein the tool is moveable relative to said plurality of material delivery heads, wherein each of the material delivery heads are configured to provide a composite material having a width of at least 12 inches,” or “operating each material delivery head so that a mandrel having a diameter of at least 14 feet is covered with said composite material at a peak rate of at least 700 pounds per hour (lbs/hr),” as required by claim 31.

The Koury reference is similarly deficient. The Koury reference relates to a method for placing fibers into a plurality of channels of a mold to form the ribs of a structural member, including panels, cylinders and cones, or even a ribbed latticework structure by itself. While providing relative movement between the mold and a plurality of fiber-placement heads, fibers are simultaneously placed into a number of the channels of the mold by means of the heads. The relative movement and placement is repeated as often as necessary in order to dispose into the channels a desired thickness of the fibers. As discussed at col. 1, lines 30-35 of the Koury reference “isogrid structures, be they in the form of panels, cylinders, cones or any other suitable shape, can be used for decking, shipping containers, walking bridges, housing material, automotive applications, shrouds, signs, support structures, wings and fuselages, nozzles, spacecraft structure, etc.” In addition, col. 6, lines 6-14 of the Koury reference mentions that “the fiber means 33 can be placed into the channels 11 of the mold 10 by the heads 22 at a rate of 90 feet per minute. The fiber means 33 have a width, for example, of 1/4 to 1/2 of an inch, although widths up to one inch could be accommodated. By way of example only, a typical flat panel size could be 3 feet by 4 feet or 3 feet by 5 feet.” (Emphasis added.)

The Zsolnay and Bendarzewski references are also deficient for at least the same reasons. For example, the Zsolnay reference relates to a precision method for placing filaments. As discussed at col. 7, lines 51-58 of the Zsolnay reference: “Tows of a great range of sizes and properties can be gathered and deposited in accordance with this invention. Miniature units applying only a few hundred filaments in each tow can be developed for efficient manufacture of very small parts. Large industrial units applying unidirectional prepreg tape several inches wide can also be developed to enhance or supplant the cut-and-transfer devices described earlier”. In addition, col. 20, lines 12-22 of the Zsolnay reference mentions that “the present

that “the present invention can use preimpregnated tow or slit tape, consisting of several hundred to several thousand or more unidirectional filaments fused together by a polymeric resin. If preferred the invention can instead use so-called “dry” tows and a resin-mixing head, mounted near the drum or tow supply, to apply resin to the tows just before or at the moment of application. In either event, generally, for the simple machine of FIGS. 8 and 9, tow width can be from 0.05 to 0.25 inch, and the thickness 0.005 to 0.015 inch (except for pultrusions).” (Emphasis added.) The Bendarzewski reference includes an identical description.

Applicants submit that the other cited references (i.e., the EP 198,744 reference and the Ermert reference) are similarly deficient because they also fail to teach or suggest, for example, that “each of the material delivery heads are configured to provide a composite material having a width of at least 12 inches,” or “that a mandrel having a diameter of at least 14 feet is covered with said composite material at a peak rate of at least 700 pounds per hour (lbs/hr),” as required by claim 31.

As such, Applicant submits that the cited references, taken individually or in combination, fail to teach or suggest “supporting a plurality of material delivery heads wherein the tool is moveable relative to said plurality of material delivery heads, wherein each of the material delivery heads are configured to provide a composite material having a width of at least 12 inches,” or “operating each material delivery head so that a mandrel having a diameter of at least 14 feet is covered with said composite material at a peak rate of at least 700 pounds per hour (lbs/hr),” as required by claim 31.

Accordingly, for at least the foregoing reasons, Applicants submit that amended claim 31, and its dependent claims 32-37, are patentable over the cited references. In addition, Applicant submits that many of the dependent claims are separately patentable since the cited references fail to teach recitations present in those claims.

#### **Independent Claims 1, 11, 19, 24, and 25**

For reasons similar to those discussed above with respect to claim 31, Applicants submit that the other independent claims 1, 11, 19, 24, 25, and their respective dependent claims 2-10, 12-18, 20-23, and 26-30 are also patentable over the cited references.

In conclusion, for the reasons given above, all claims now presently in the application are believed allowable and such allowance is respectfully requested. Should the Examiner have any questions or wish to further discuss this application, Applicants request that the Examiner contact the undersigned attorney at (480) 385-5060.

If for some reason Applicants have not requested a sufficient extension and/or have not paid a sufficient fee for this response and/or for the extension necessary to prevent abandonment on this application, please consider this as a request for an extension for the required time period and/or authorization to charge Deposit Account No. 50-2091 for any fee which may be due.

Respectfully submitted,

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